

2.5

①

Point - Slope  $y - y_1 = m(x - x_1)$

Slope - Intercept  $y = mx + b$

Point  $(x_1, y_1)$

**Ex1** Write equation of the line through point  $(-4, 1)$ , with slope  $-3$

Use point - slope

$$y - 1 = -3(x - -4)$$

$$y - 1 = -3(x + 4)$$

$$y - 1 = -3x - 12$$

---


$$y = -3x - 11$$

**Ex2**  $(x_1, y_1)$   $(-3, 2)$  and  $(x_2, y_2)$   $(2, -4)$  Result  
in standard form  $Ax + By = C$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - 2}{2 - -3} = \frac{-6}{2 + 3} = \left(\frac{-6}{5}\right)$$

$$y - y_1 = m(x - x_1)$$

$$y - 2 = \frac{-6}{5}(x - -3)$$

$$5y - 2 = -\frac{6}{5}(x + 3)$$

$$5y - 10 = -6(x + 3)$$

$$\begin{array}{r}
 5y - 10 = -6x - 18 \\
 +6x \quad +10 \quad +6x \quad +10 \\
 \hline
 \end{array}
 \rightarrow$$

$$6x + 5y = -8$$

**Ex 3** Find slope + intercept from equation of a line.

$$\begin{array}{r}
 4x + 5y = -10 \\
 -4x \qquad \qquad \qquad -4x \\
 \hline
 \end{array}$$

$$5y = \frac{-4x}{5} - \frac{10}{5}$$

$$y = -\frac{4}{5}x - 2$$

$$\text{Slope} = m = -\frac{4}{5}$$

$$y\text{-intercept} = b = -2$$

**Ex 4** Write Equation of line through Graph.  $(x_1, y_1) = (1, 1)$  and  $(x_2, y_2) = (2, 4)$

$$m = \frac{4-1}{2-1} = \frac{3}{1} = 3 = m$$

$$y = mx + b$$

solve for b

$$1 = 3(1) + b$$

$$1 = 3 + b$$

$$-3 \quad -3$$

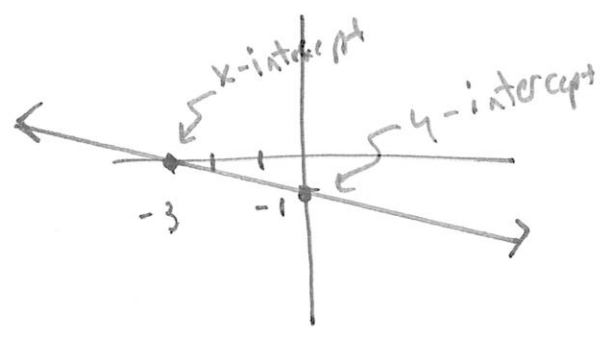
$$-2 = b$$

$$y = 3x - 2$$

Ex 5

(a) Identify slope, y-intercept, x-intercept

(b) Write equation



y-intercept =  $(-1)$   $(x_1, y_1)$   
 $(0, -1)$   
 x-intercept =  $-3$   $(x_2, y_2)$   
 $(-3, 0)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - (-1)}{-3 - 0}$$

$$= \frac{0 + 1}{-3} = \left(\frac{-1}{3} = m\right)$$

$$y = mx + b$$

$$y = -\frac{1}{3}x - 1$$